# SAS to SAS/SATA JBOD Subsystem

# User Manual

**Revision 1.0**

# Table of Contents

**Chapter 1 Introduction ..... 3**
1.1 Features ..... 4
1.2 Technical Specifications ..... 5
1.3 Unpacking the JBOD Subsystem ..... 6
1.4 Identifying Parts of the JBOD Subsystem ..... 7
1.4.1 Front View ..... 7
1.4.2 Rear View ..... 8
1.4.3 JBOD Controller Module ..... 8
1.4.3.1 JBOD Controller Panel ..... 8
1.5 Power Supply Fan Module (PSFM) ..... 9
1.5.1 PSFM Panel ..... 10
1.6 LCD Display Panel ..... 11
1.6.1 LCD Panel LED ..... 11
1.6.2 LCD Panel Function Buttons ..... 12
1.7 Drive Carrier Module ..... 13
1.7.1 Disk Drive Status Indicators ..... 13
1.7.2 Drive Carrier Lock Indicator ..... 14
**Chapter 2 Installation of JBOD Subsystem ..... 15**
2.1 Powering On ..... 15
2.2 Disk Drive Installation ..... 16
2.2.1 Installing a SAS Disk Drive in a Disk Tray ..... 16
2.3 Connecting the JBOD Subsystem ..... 19
2.3.1 Connecting to SAS HBA ..... 19
2.3.2 Connecting to RAID Subsystem ..... 19
**Chapter 3 Maintenance ..... 20**
3.1 Monitoring the RAID Environment ..... 20
3.2 Upgrading Firmware ..... 22
3.3 Replacing JBOD Subsystem Components ..... 24
3.3.1 Replacing JBOD Controller Module ..... 24
3.3.2 Replacing Power Supply Fan Module ..... 25
3.3.2.1 Replacing Power Supply Fan Module with Plate Cover ..... 26

# Chapter 1 Introduction

**The 16 bays JBOD Subsystem**

The JBOD subsystem is a 19-inch 3U 16 bays rackmount JBOD unit. It features the latest SASII (6Gb/s) interface and designed to fit in with the environments which needed highly reliable and relentless data growth. The JBOD subsystem is also a versatile SAS / SATA Disk Expansion system, ideal for high capacity and scalability storage in IT demands. Based on the 6G SAS technology, the JBOD subsystem supports the choice of SAS and SATA drive configurations to deliver the best cost-performance index with higher bandwidth.

## 1.1 Features

- 16 hot-swappable drive bays in a rackmount 3U chassis
- Simultaneously support SAS or SATA disk
- Single SAS JBOD controller module
- Each SAS JBOD controller module has three mini SAS (4X) ports
- Power Supply and cooling system contained in 1 module for efficient cooling
- Two 500W redundant hot swappable power supplies
- Incorporates a cableless design for maximum signal integrity
- Utilizes industry-standard SCSI Enclosure Services to monitor enclosure and disk environmental conditions

**Enclosure Monitoring**

- S.E.S. support for standard enclosure management
- System LED indications
- Fan speed monitoring
- Power supply monitoring
- System voltage monitoring
- System temperature monitoring
- System alarm

## 1.2 Technical Specifications

| | |
|---|---|
| **RAID Controller** | JBOD |
| **Controller** | Single |
| **Host Interface** | One 4x mini SAS (6Gb/s) |
| **Disk Interface** | SAS/SAS2 (3Gb/6Gb) or SATA II/III* |
| **SAS expansion** | Two 4x mini SAS (6Gb/s) |
| **Capacity** | |
| **- Direct Attached** | 16 Disks |
| **- Expansion** | Please refer to RAID controller specification |
| **Monitor Port support** | Yes |
| **Enclosure** | |
| **Platform** | Rackmount |
| **Form Factor** | 3U |
| **# of Hot Swap Trays** | 16 |
| **Tray Lock** | Yes |
| **Disk Status Indicator** | Access / Fail LED / Power LED |
| **Backplane** | SAS / SATA Single BP |
| **# of PS/Fan Modules** | 500W x 2 w/PFC |
| **# of Fans** | 4 |
| **Power requirements** | AC 90V ~ 264V Full Range, 10A ~ 5A, 47Hz ~ 63Hz |
| **Environmental** | |
| **Relative Humidity** | 10% ~ 85% Non-condensing |
| **Operating Temperature** | 10°C ~ 40°C (50°F ~ 104°F) |
| **Physical Dimension** | 590(L) x 482 (W) x 131(H) mm |
| **Weight** | 24 Kg (Without Disk) |

* Request optional dongle board for SATA II/III hard drive.

## 1.3 Unpacking the JBOD Subsystem

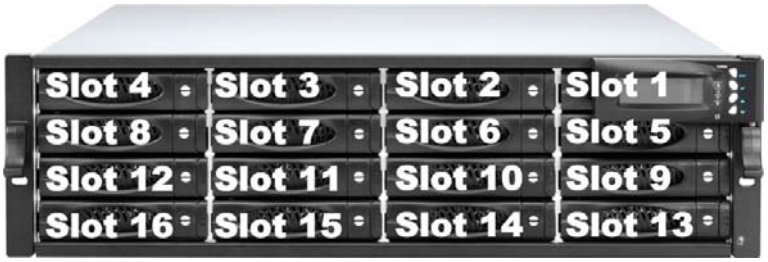
The shipping package contains the following:

| | |
|---|---|
| | JBOD Subsystem Unit |
| | Two (2) power cords |
| | One (1) serial cable (RJ11 to DB9) |
| | One (1) external Mini SAS cable SFF-8088 to SFF-8088 |
| | One(1) PSFM Plate Cover |
| | User Manual |

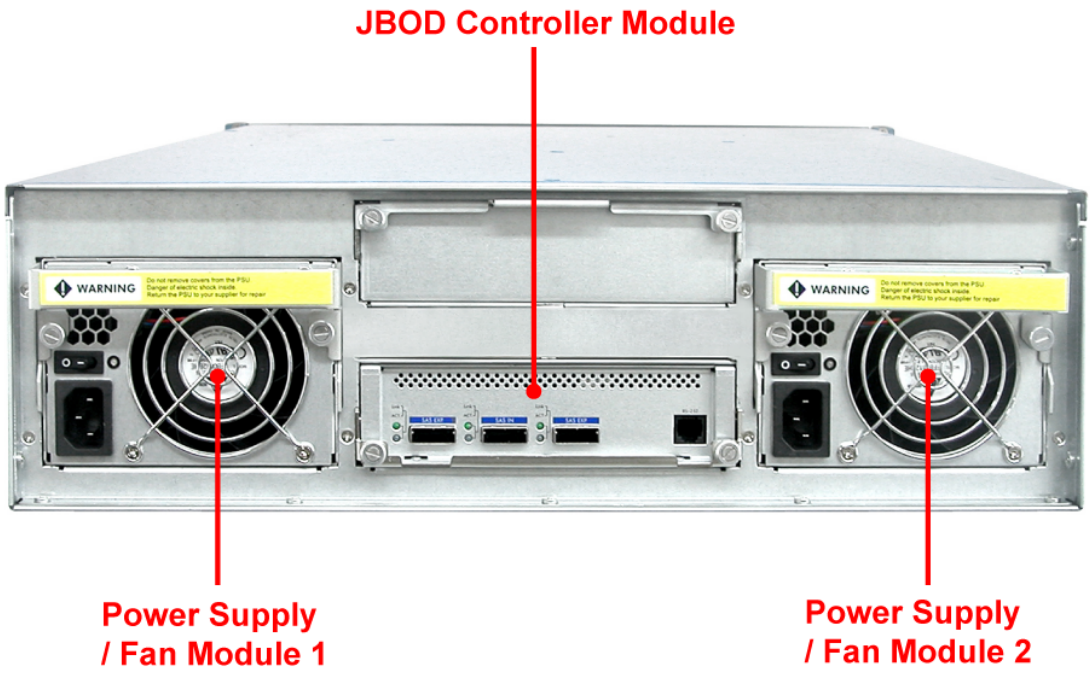
## 1.4 Identifying Parts of the JBOD Subsystem

The illustrations below identify the various parts of the expansion chassis.

### 1.4.1 Front View

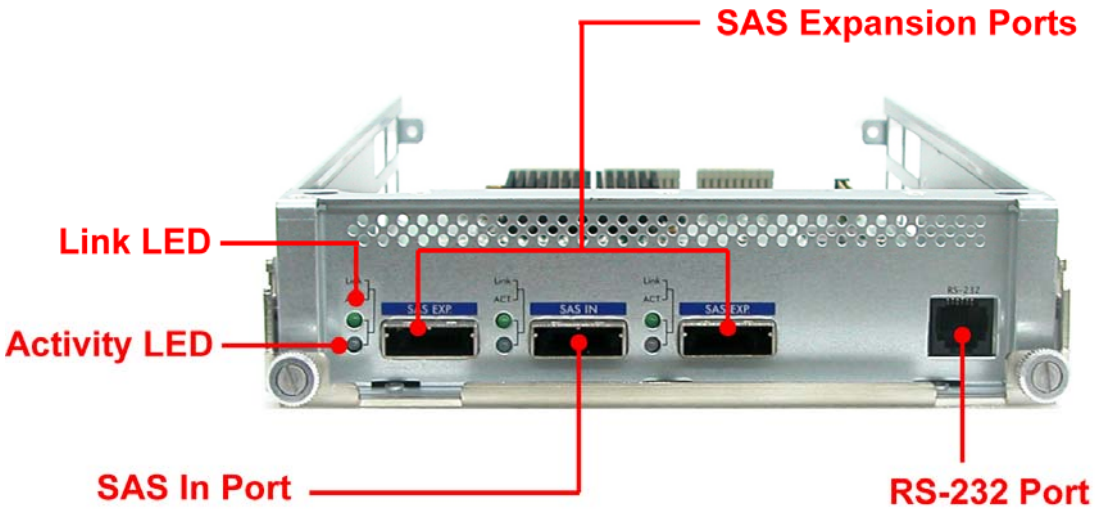


### 1.4.2 Rear View




### 1.4.3 JBOD Controller Module

#### 1.4.3.1 JBOD Controller Panel



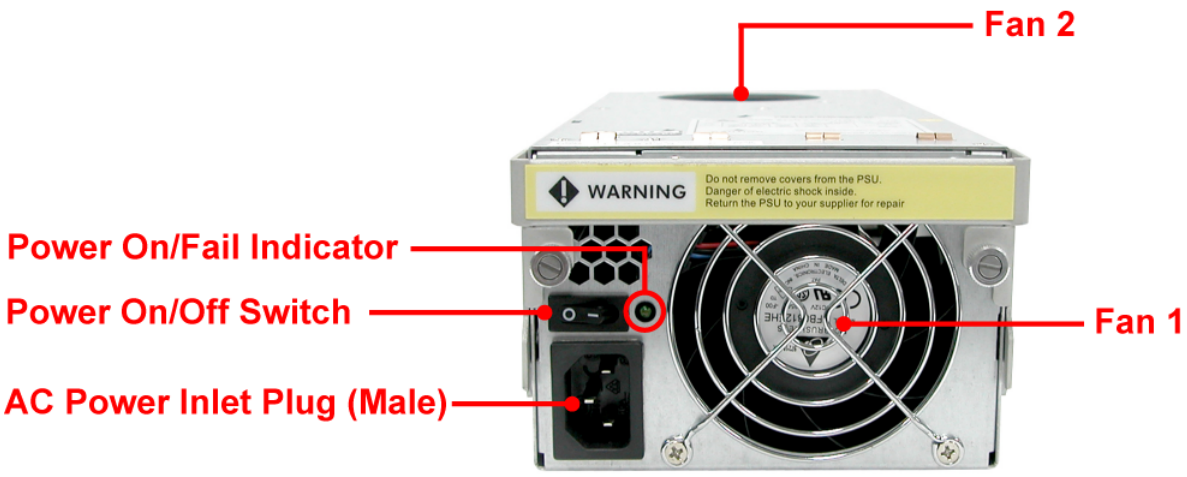
| Part | Description |
|---|---|
| SAS In Port | Use to connect to SAS HBA or to RAID subsystem's SAS Expansion Port. |
| SAS Expansion Port | Use to connect to the SAS In Port of another JBOD subsystem. |
| RS-232 Port | Use to upgrade the firmware of the JBOD controller. Connect the RJ11-to-DB9 serial cable to your system's serial port. |

| Indicator | Color | Description |
|---|---|---|
| Link LED | Green | Indicates expander has connected or linked. |
| Activity LED | Blinking Blue | Indicates the expander is busy and being accessed. |

## 1.5 Power Supply Fan Module (PSFM)

The JBOD subsystem contains **two 500W Power Supply / Fan Modules**. All PSFMs are inserted into the rear of the chassis.

### 1.5.1 PSFM Panel


Fan 2
WARNING
Do not remove covers from the PSU.
Danger of electric shock inside.
Return the PSU to your supplier for repair
Power On/Fail Indicator
Power On/Off Switch
AC Power Inlet Plug (Male)
Fan 1

The panel of the Power Supply/Fan Module contains: the Power On/Off Switch, the AC Inlet Plug, and a Power On/Fail Indicator showing the Power Status LED, indicating ready or fail.

Each fan within a PSFM is powered independently of the power supply within the same PSFM. So if the power supply of a PSFM fails, the fan associated with that PSFM will continue to operate and cool the enclosure.

When the power cord connected from main power source is inserted to the AC Power Inlet, the power status LED becomes RED. When the switch of the PSFM is turned on, the LED will turn GREEN. When the Power On/Fail LED is GREEN, the PSFM is functioning normally.

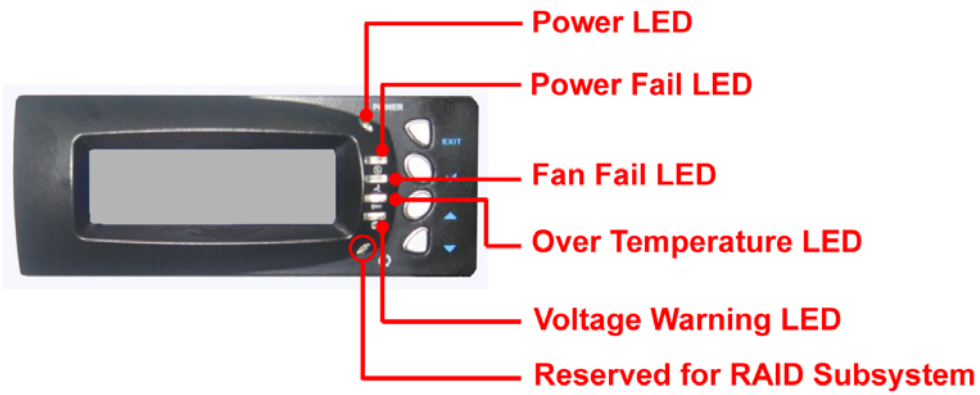
**NOTE: Each PSFM has one Power Supply and two Fans. PSFM 1 has Power#1, Fan#1 and Fan#2. The PSFM 2 has Power#2, Fan#3 and Fan#4. When the Power Supply of a PSFM fails, the PSFM need not be removed from the slot if replacement is not yet available. The fan will still work and provide necessary airflow inside the enclosure.**

**In replacing the failed PSFM, refer to section 3.2.2 of this manual.**

**NOTE: After replacing the Power Supply Fan Module and turning on the Power On/Off Switch of the PSFM, the Power Supply will not power on immediately. The Fans in the PSFM will spin-up until the RPM becomes stable. When Fan RPM is already stable, the RAID controller will then power on the Power Supply. This process takes more or less 30 seconds. This safety measure helps prevent possible Power Supply overheating when the Fans cannot work.**

## 1.6 LCD Display Panel

### 1.6.1 LCD Panel LED




| Parts | Function |
|---|---|
| Power LED | Green indicates power is ON. |
| Power Fail LED | If one of the redundant power supply unit fails, this LED will turn to RED and alarm will sound. |
| Fan Fail LED | Turn RED when fan 1 or 2 fails, or speed is lower than 500 RPM. |
| Over Temperature LED | If disk temperatures exceed 60°C, the Over Temperature LED will turn RED and alarm will sound. |
| Voltage Warning LED | An alarm will sound if detected voltage in the controller is abnormal and LED will turn RED. |

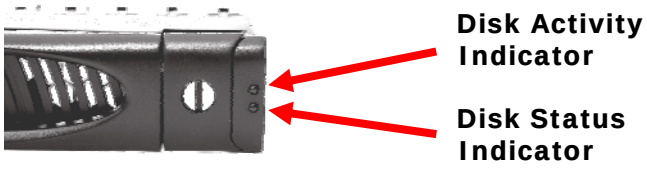
### 1.6.2 LCD Panel Function Buttons

| Parts | | Function |
|---|---|---|
| Up and Down Arrow buttons | ▲ ▼ | Use the Up or Down arrow keys to go through the information on the LCD screen. This is also used to move between each menu. |
| Select button | ✔ | This is used to enter the option you have selected. |
| Exit button | EXIT | Press this button to return to the previous menu. |

## 1.7 Drive Carrier Module

The Drive Carrier Module houses a 3.5 inch hard disk drive. It is designed for maximum airflow and incorporates a carrier locking mechanism to prevent unauthorized access to the HDD.

### 1.7.1 Disk Drive Status Indicators




| Part | Function |
|---|---|
| Disk Activity Indicator | This LED will blink blue when the hard drive is being accessed. |
| Disk Status Indicator | Green LED indicates power is on and hard drive status is good for this slot. If there is no hard drive, the LED is Red. The fault indicator depends on the RAID card or RAID Controller definition. |

### 1.7.2 Drive Carrier Lock Indicator

Every Drive Carrier is lockable and is fitted with a lock indicator to indicate whether or not the carrier is locked into the chassis or not. Each carrier is also fitted with an ergonomic handle for easy carrier removal.

When the Lock Groove is vertical, then the Drive Carrier is unlocked.

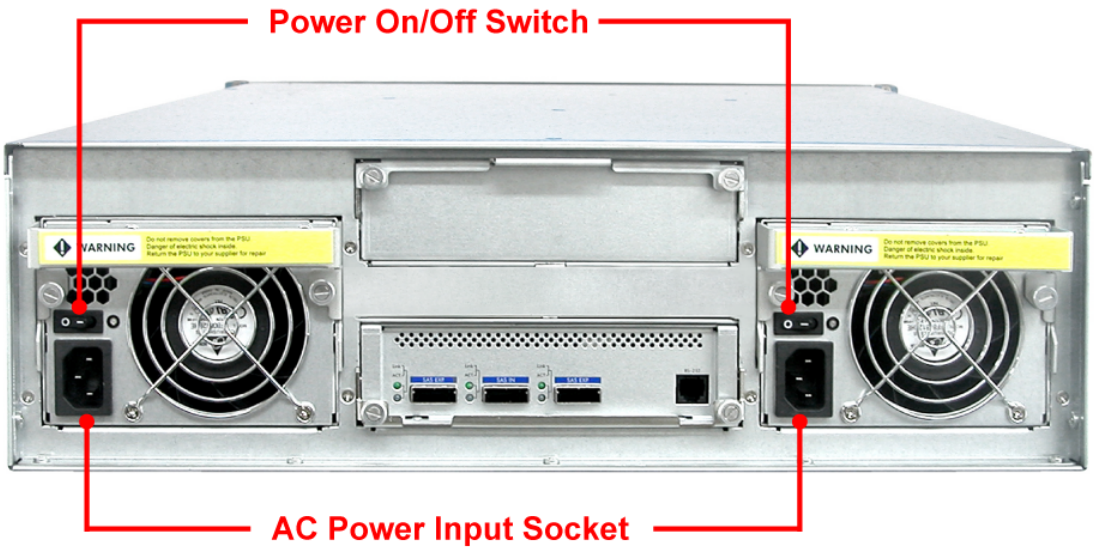
When the Lock Groove is horizontal, this indicates that the Drive Carrier is locked.

Lock and unlock the Drive Carriers by using a flat-head screw driver.

# Chapter 2 Installation of JBOD Subsystem

## 2.1 Powering On

1. Plug in the power cords into the AC Power Input Socket located at the rear of the subsystem.




**NOTE: The subsystem is equipped with redundant, full range power supplies with PFC (power factor correction). The system will automatically select voltage.**

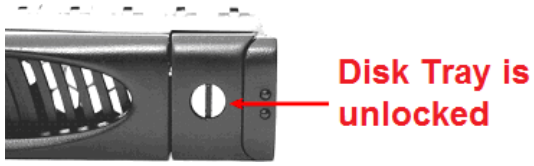
2. Turn on each Power On/Off Switch to power on the subsystem.
3. The Power LED on the front panel will turn green.

## 2.2 Disk Drive Installation

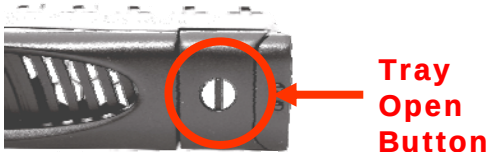
This section describes the physical locations of the hard drives supported by the subsystem and give instructions on installing a hard drive. The subsystem supports hot-swapping allowing you to install or replace a hard drive while the subsystem is running.

### 2.2.1 Installing a SAS Disk Drive in a Disk Tray

1. Unlock the Disk Trays using a flat-head screw driver by rotating the Lock Groove.




2. Press the Tray Open button and the Disk Tray handle will flip open.




3. Pull out an empty disk tray.

4. Place the hard drive in the disk tray. Turn the disk tray upside down. Align the four screw holes of the SAS disk drive in the four Hole A of the disk tray. To secure the disk drive into the disk tray, tighten four screws on these holes of the disk tray. Note in the picture below where the screws should be placed in the disk tray holes.

**NOTE: All the disk tray holes are labelled accordingly.**

5. Slide the tray into a slot.

6. Press the lever in until you hear the latch click into place. The HDD Fault LED will turn green when the subsystem is powered on and HDD is good.

7. If necessary, lock the Disk Tray by turning the Lock Groove.

## 2.3 Connecting the JBOD Subsystem

### 2.3.1 Connecting to SAS HBA

The Enclosure supports SAS interface which provides fast 300MB data transfer rate using SAS phy. The package comes with one SAS cable for single JBOD controller module.

Attach one end of the SAS cable to the SAS IN Port and the other end to the host bus adapter's (HBA) external SAS connector or to the SAS Switch. (The host bus adapter is installed in your Host computer system.)

### 2.3.2 Connecting to RAID Subsystem

Attach one end of the SAS cable to the SAS IN Port of the JBOD controller module and the other end to the SAS Expansion Port on the RAID controller of RAID subsystem.

# Chapter 3 Maintenance

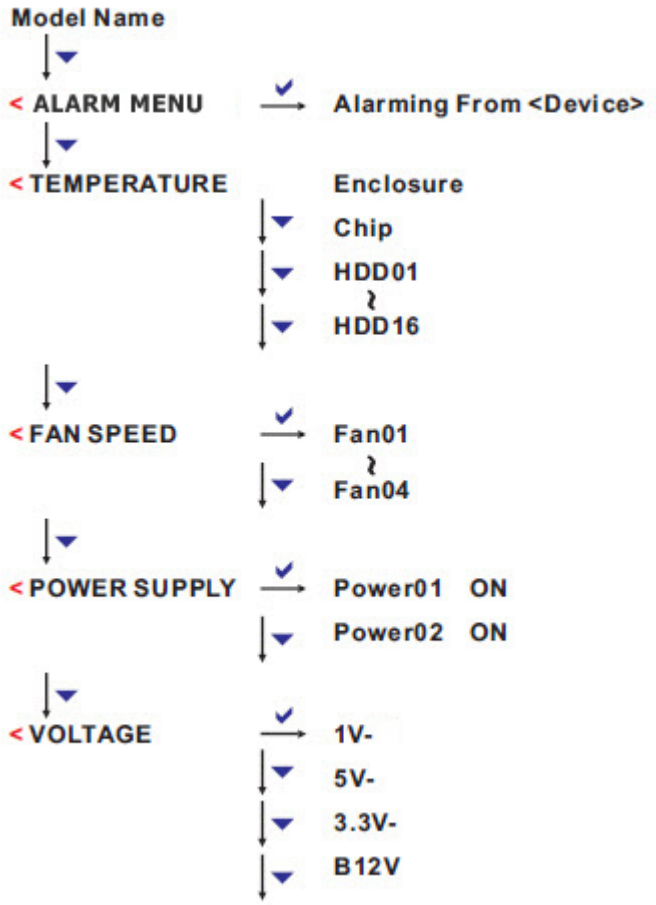
## 3.1 Monitoring the RAID Environment

After power on the enclosure, the screen on the LCD panel will show the following message:

```
{Model Name}
<ALARM MENU
```

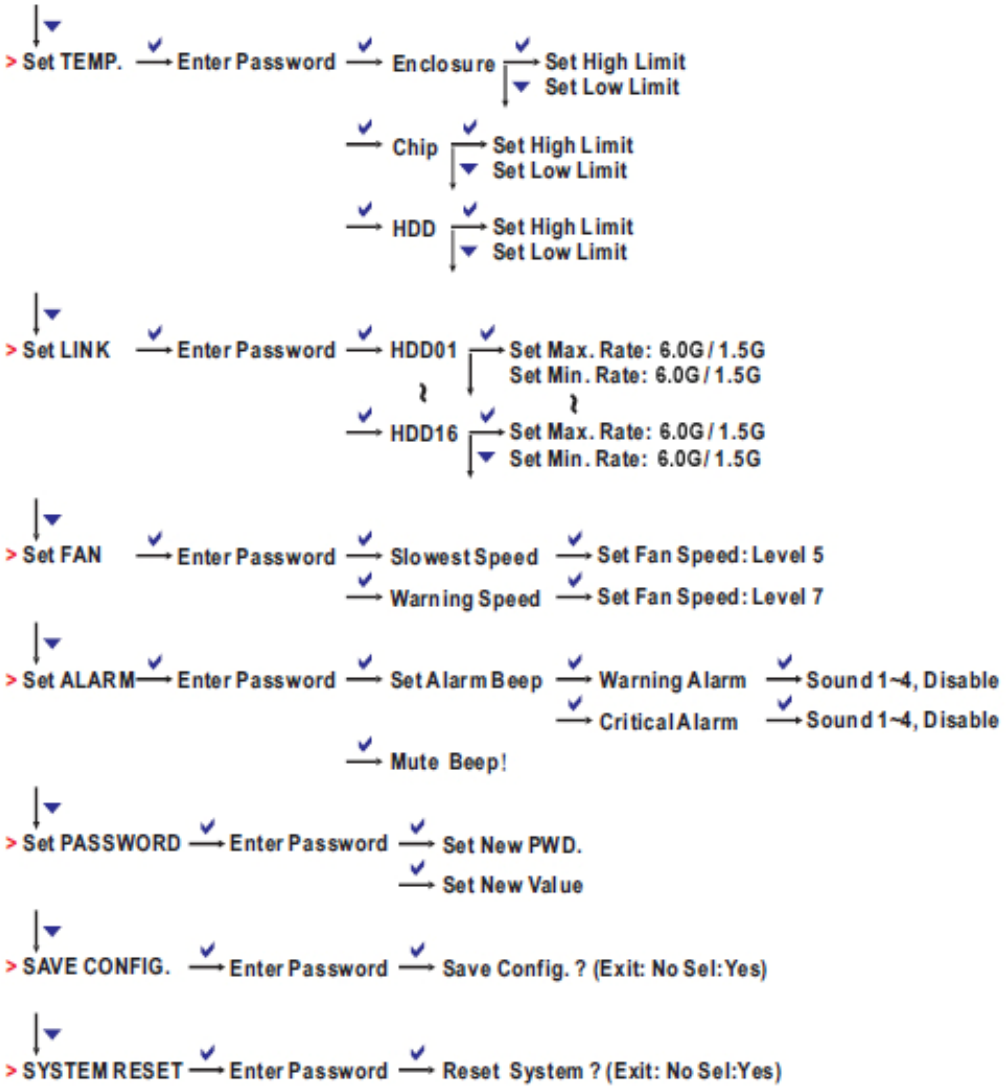
Press the " ▼ " button to enter the menu

The following tree diagram is a summary of the various monitor functions that can be accessed through the LCD panel.



Press the " ▼ " button to enter the configure menu.

The enclosure has a setup configuration utility allows user to set temperature, LINK, FAN, Alarm and Password. The following tree diagram is a summary of the various setting functions that can be accessed through the LCD panel.



## 3.2 Upgrading Firmware

### Upgrading Firmware Through Terminal

**NOTE: It is important to stop I/O access to JBOD subsystem during firmware upgrade.**

1. Please use the RS232 cable (RJ11 to DB9) and to connect JBOD RS232 Port and PC COM1 Port (or change to other COM Port as necessary).
2. Open Windows HyperTerminal Program. Connect using COM1 (COM Port used in Step1), Baud Rate: 115200, n, 8, 1, Flow Control: None.
3. Press the Enter key and the password prompt will be displayed.
4. Key in the password (Default password: 00000000) to login to CLI.
5. At CLI prompt, input the command to update firmware.

   a. **CLI>**

   **NOTE:**

   **"fdl code 0" is the command to update flash firmware code (.fw file).**

   **"fdl mfgb 0" is the command to update CFG data code (.rom file) Make sure you have both files before updating.**

   b. **CLI> fdl mfgb 0**

   Please Use XModem Protocol for File Transmission.

   Use Q or q to quit Download before starting XModem.

   Offset = 0x0

   c. Select Function menu to transfer CFG data .rom file: "Function" ➔ "Transfer" ➔ "Send File" ➔ "Browse" ➔ "Open" and select the .rom file (for example: **8016-mfgdat6-20110131.rom)** firmware folder location. Select "Xmodem" Protocol to send firmware file (**Only need about 60 seconds to finish sending firmware file. If not, please repeat steps B and D again**).

   Note. If won't to transfer CFG data .rom file, Press Q or q to quit Download before starting data transfer.

   d. **CLI>fdl code 0**

   Please Use XModem Protocol for File Transmission.

   Use Q or q to quit Download before starting XModem.

   Offset = 0x0

e. Select Functon menu to transfer firmware file: “Function” ➔ “Transfer” ➔ “Send File” ➔ “Browse” ➔ “Open” and select the .fw file (for example: **8016-07.01.09.96-20110211.fw)** from firmware folder location. Select “Xmodem” Protocol to send firmware file (**Only need about 60 seconds to finish sending firmware file. If not, please repeat steps D and E again**).

Note. If won’t to transfer firmware data .fw file, Press Q or q to quit Download before starting data transfer.

f. Use “reset” command to Restart JBOD or power cycle

g. Re-login to JBOD CLI.

h. Use “sys” command to verify JBOD firmware version.
**CLI>sys**

i. If needed, the “reset” command can also be used to restart the JBOD controller. (Normally used in single JBOD Controller mode, If already to connect to Controller )

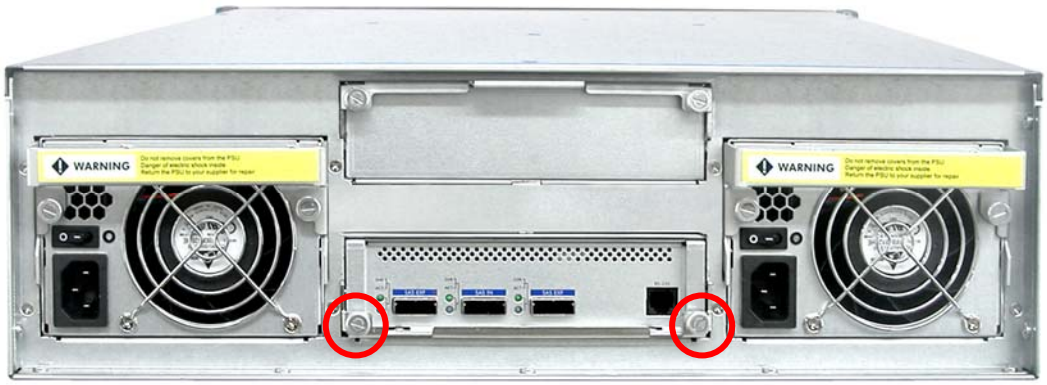
**CLI>reset**

## 3.3 Replacing JBOD Subsystem Components

### 3.3.1 Replacing JBOD Controller Module

When replacing a failed Controller Module, please follow these steps:

1. Make sure the subsystem is in power off state. Loosen the thumbscrews on the sides of the Controller Module case.
2. Use the Controller handle to pull out the defective Controller.
3. Insert and slide the new Controller in. Note that it may be necessary to remove the old/defective Controller Module from the case and install the new one.
4. Tighten the thumbscrews on the sides of the Controller Module case.



### 3.3.2 Replacing Power Supply Fan Module

When replacing a failed power supply fan module (PSFM), please follow these steps:

1. Turn off the Power On/Off Switch of the failed PSFM.
2. Disconnect the power cord from the AC Inlet Plug of PSFM.
3. Loosen thumbscrews of the PSFM.
4. Use the handle to pull out the defective PSFM.
5. Before inserting the new PSFM, make sure the Power On/Off Switch is on "Off" state.
6. Insert and slide the new PSFM in until it clicks into place.

**IMPORTANT: When the subsystem is online and a Power Supply fails, and the replacement Power Supply module is not yet available, the failed Power Supply Module can be replaced with the Plate Cover. This is to maintain proper airflow within the enclosure. (Refer to next section)**

**When replacing a failed component online, it is not recommended to remove the failed component for a long period of time; proper air flow within the enclosure might fail causing high controller/disk drive temperature.**

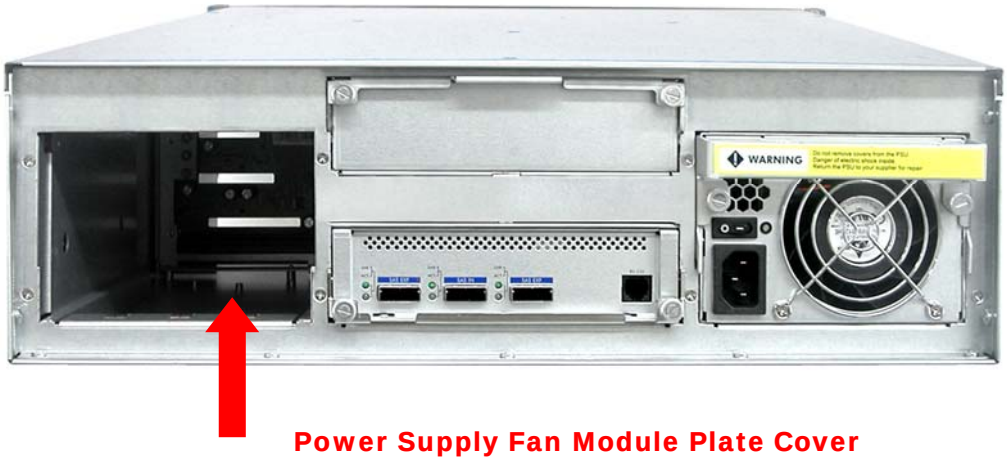
7. Connect the power cord to the AC Inlet Plug of PSFM.
8. Tighten the thumbscrews of the PSFM.
9. Turn on the Power On/Off Switch of the PSFM.

**NOTE: After replacing the Power Supply Fan Module and turning on the Power On/Off Switch of the PSFM, the Power Supply will not power on immediately. The Fans in the PSFM will spin-up until the RPM becomes stable. When Fan RPM is already stable, the RAID controller will then power on the Power Supply. This process takes more or less 30 seconds. This safety measure helps prevent possible Power Supply overheating when the Fans cannot work.**

### 3.3.2.1 Replacing Power Supply Fan Module with Plate Cover

When replacing a failed power supply fan module (PSFM) with Plate Cover, please follow these steps:

1. Turn off the Power On/Off Switch of the failed PSFM.
2. Disconnect the power cord from the AC Inlet Plug of PSFM.
3. Loosen thumbscrews of the failed PSFM.
4. Pull out the defective PSFM.
5. Insert the PSFM Plate Cover carefully.




**Power Supply Fan Module Plate Cover**